

**Supplementary Table S1.** Information on laboratory methods used to measure serum and red blood cell folate biomarkers in the US population  $\geq 1$  year, NHANES 2011–2<sup>a</sup>

<b>Biomarker</b>	<b>Method</b>	<b>Matrix</b>	<b>QC pool</b>	<b>Concentration (nmol/L)</b>	<b>Imprecision (%)</b>	<b># of Runs (n)</b>	<b>LOD (nmol/L)</b>
5-MethylTHF	HPLC-MS/MS	Serum	Low	18.2	2.5	151	0.31
			Medium	33.5	2.5	151	
			High	48.3	2.3	151	
UMFA	HPLC-MS/MS	Serum	Low	0.68	16.0	147	0.14
			Medium	5.46	10.4	147	
			High	10.5	11.1	147	
THF	HPLC-MS/MS	Serum	Medium	1.40	11.9	144	0.37
			High	4.39	6.8	144	
5-FormylTHF	HPLC-MS/MS	Serum	Medium	0.67	9.8	143	0.30
			High	2.41	3.8	143	
5,10-MethenylTHF	HPLC-MS/MS	Serum	Medium	1.45	6.6	143	0.34
			High	4.43	4.1	143	
MeFox	HPLC-MS/MS	Serum	Low	1.42	6.2	143	0.34
			Medium	1.52	6.1	143	
			High	2.90	5.1	143	
Total folate	Microbiologic assay	RBC	Low A	421	6.2	63	105
			Medium A	592	5.4	63	
			High A	899	6.5	63	
			Low B	590	7.6	43	
			Medium B	924	8.9	43	
			High B	1470	7.3	43	

NHANES, National Health and Nutrition Examination Survey; QC, quality control; LOD, limit of detection; 5-methylTHF, 5-methyltetrahydrofolate; UMFA, unmetabolized folic acid; THF, tetrahydrofolate; 5-formylTHF, 5-formyltetrahydrofolate; 5,10-methenylTHF, 5,10-methenyltetrahydrofolate; MeFox, pyrazino-s-triazine derivative of 4 $\alpha$ -hydroxy-5-methylTHF; RBC, red blood cell.

<sup>a</sup> Imprecision is expressed as CV; LOD for RBC total folate measured by microbiologic assay is based on an assumed hematocrit of 40% and the lowest possible dilution of whole-blood hemolysates (1:40).

**Supplementary Table S2.** Characteristics of US participants  $\geq 1$  year by variable categories, NHANES 2011–2<sup>a</sup>

Variable	Sample size ( <i>n</i> )	Estimate (unweighted) (%)	Estimate (weighted) (%)
Age, years			
1–5	1135	12.8	6.8
6–11	1272	14.2	8.1
12–19	1230	13.7	11.2
20–39	1878	21.0	26.8
40–59	1754	19.6	28.0
$\geq 60$	1687	18.8	19.1
Sex			
Male	4463	49.8	48.8
Female	4493	50.2	51.2
Race-ethnicity			
Hispanic <sup>b</sup>	2195	24.5	16.6
Mexican-American	1226	13.7	9.6
Non-Hispanic Asian	1191	13.3	5.1
Non-Hispanic Black	2492	27.8	12.4
Non-Hispanic White	2729	30.5	63
Fasting time, hours			
<3	2965	34.8	33.5
3–<8	1915	22.5	20.0
$\geq 8$	3648	42.8	46.6
eGFR <sup>c</sup> , mL/(min $\times$ 1.73 m <sup>2</sup> )			
0–<60	471	7.9	7.5
60–<90	2058	34.4	41.0
$\geq 90$	3447	57.7	51.5
BMI <sup>d</sup>			
Underweight	1833	21.3	13.1
Normal weight	2669	31.0	30.8
Overweight	2019	23.5	28.1
Obese	2081	24.2	28.1
BSA <sup>e</sup> , m <sup>2</sup>			
<1.5	2537	29.5	17.9
1.5–1.8	2241	26.1	27
1.8–2	1752	20.4	23.9
$\geq 2$	2072	24.1	31.2

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Serum cotinine <sup>f</sup> , µg/L			
≤10	6108	82.8	80.4
>10	1270	17.2	19.7
Alcohol intake <sup>g</sup>			
No drinks	1637	33.0	25.7
<1 (not 0)	2704	54.5	58.5
1–<2	365	7.4	9.3
≥2	256	5.2	6.6
Supplement use <sup>h</sup>			
Yes	1536	18.9	23.1
No	6601	81.1	76.9

NHANES, National Health and Nutrition Examination Survey; eGFR, estimated glomerular filtration rate; BSA, body surface area.

<sup>a</sup> Used sample weights for Mobile Examination Center participants ≥1 year to calculate percent estimates.

<sup>b</sup> Hispanic, [Mexican American + other Hispanic]

<sup>c</sup> Used to assess kidney function; available for persons ≥12 years; impaired kidney function was defined as eGFR <60 mL/(min×1.73 m<sup>2</sup>)

<sup>d</sup> BMI definitions: <18.5 kg/m<sup>2</sup> (underweight); 18.5–<25 kg/m<sup>2</sup> (normal weight); 25–<30 kg/m<sup>2</sup> (overweight); and ≥30 kg/m<sup>2</sup> (obese)

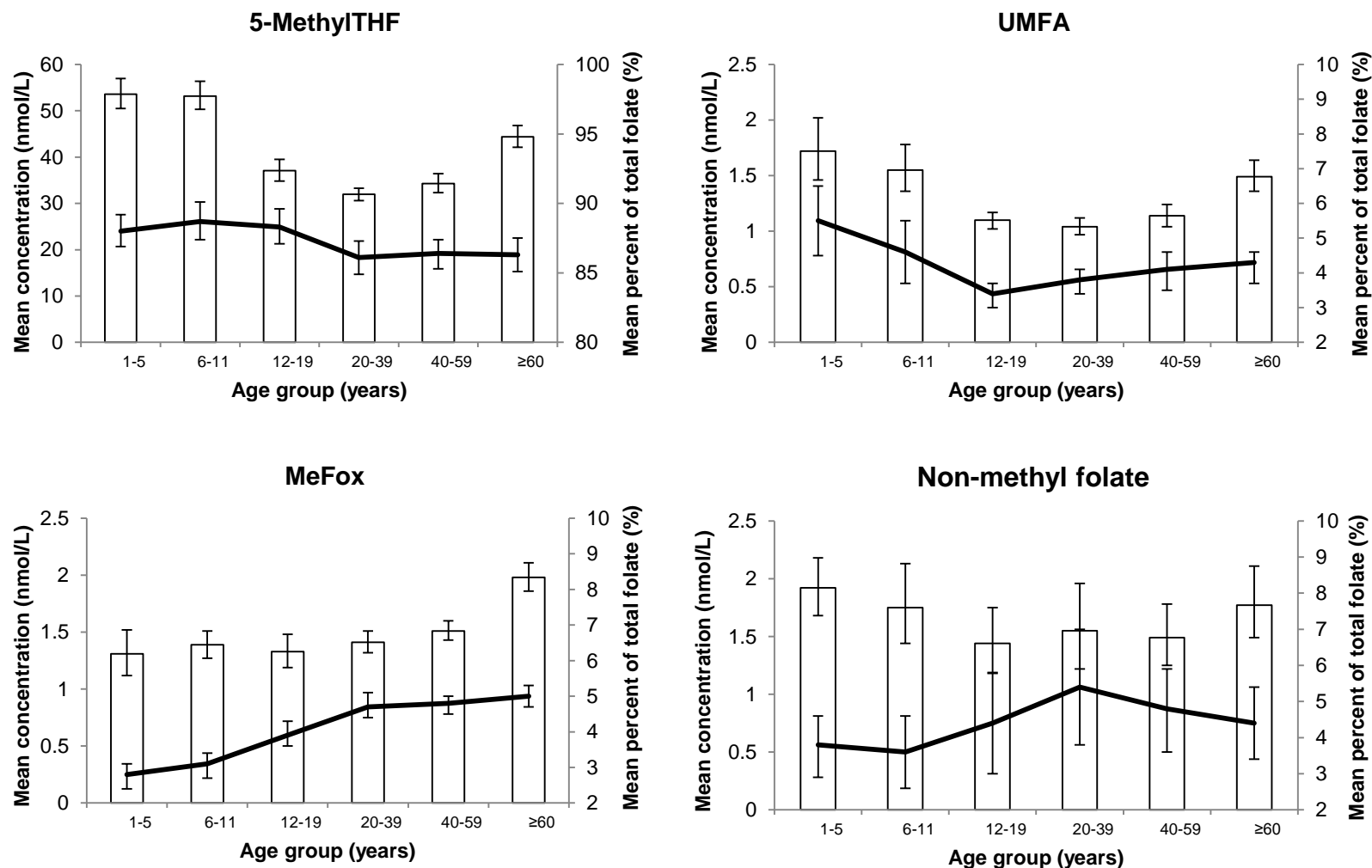
<sup>e</sup> Calculated as square root of [(height in cm × weight in kg)/3600] or square root of [(height in inches × weight in pounds)/3131]

<sup>f</sup> Biomarker of tobacco smoke exposure; concentrations >10 µg/L are considered to represent smokers

<sup>g</sup> Calculated as average daily number of “standard” drinks [(quantity × frequency) / 365.25]; 1 drink ≈ 15 g ethanol

<sup>h</sup> Folic acid-containing dietary supplements used during the last 24 hours prior to visiting the Mobile Examination Center

**Supplementary Fig. S1.** Serum folate forms by age group for the total US population  $\geq 1$  year, NHANES 2011–2.



Bars represent geometric mean concentration; lines represent mean percent of total folate; error bars represent 95% CI. Serum folate forms and serum total folate (sum of folate forms including MeFox) were measured by HPLC-MS/MS. Non-methyl folate represents the sum of the three minor forms tetrahydrofolate, 5-formyltetrahydrofolate and 5,10-methenyltetrahydrofolate. 5-MethylTHF, 5-methyltetrahydrofolate; MeFox, pyrazino-s-triazine derivative of 4 $\alpha$ -hydroxy-5-methylTHF; UMFA, unmetabolized folic acid.

**Supplementary Table S3.** Contributions of various folate forms to serum total folate by weighted decile of serum total folate for the US population  $\geq 1$  y, NHANES 2011–2<sup>a</sup>

Decile category (nmol/L)	Sample size (n)	5-MethylTHF	UMFA	Non-methyl folate	MeFox
Mean concentration (95% CI) (nmol/L)					
1 <sup>st</sup> (<22.84)	770	14.5 (14.0 – 15.1)	.778 (.729 – .827)	1.61 (1.13 – 2.10)	1.18 (1.01 – 1.34)
2 <sup>nd</sup> (22.84–<28.05)	714	21.4 (21.0 – 21.9)	.898 (.834 – .963)	1.71 (1.22 – 2.21)	1.51 (1.36 – 1.65)
3 <sup>rd</sup> (28.05–<33.0)	721	26.1 (25.5 – 26.7)	.975 (.900 – 1.05)	1.79 (1.26 – 2.32)	1.66 (1.52 – 1.80)
4 <sup>th</sup> (33.0–<38.46)	744	31.2 (30.8 – 31.6)	1.02 (.939 – 1.11)	1.69 (1.26 – 2.12)	1.80 (1.65 – 1.95)
5 <sup>th</sup> (38.46–<43.53)	713	36.3 (35.9 – 36.7)	1.13 (1.02 – 1.24)	1.73 (1.36 – 2.10)	1.82 (1.66 – 1.99)
6 <sup>th</sup> (43.53–<49.68)	734	41.6 (40.9 – 42.3)	1.37 (1.21 – 1.53)	1.93 (1.34 – 2.51)	1.99 (1.80 – 2.19)
7 <sup>th</sup> (49.68–<56.81)	735	47.4 (46.8 – 48.0)	1.69 (1.34 – 2.03)	1.96 (1.43 – 2.49)	2.06 (1.84 – 2.27)
8 <sup>th</sup> (56.81–<66.52)	786	55.3 (54.8 – 55.8)	1.87 (1.63 – 2.12)	1.95 (1.50 – 2.40)	2.21 (1.96 – 2.45)
9 <sup>th</sup> (66.52–<82.48)	804	66.4 (65.6 – 67.2)	2.99 (2.58 – 3.39)	2.13 (1.57 – 2.69)	2.20 (2.04 – 2.36)
10 <sup>th</sup> ( $\geq 82.48$ )	721	88.4 (83.8 – 92.9)	13.9 (11.1 – 16.7)	3.08 (2.37 – 3.79)	3.06 (2.82 – 3.29)
Mean percent of total folate (95% CI) (%)					
1 <sup>st</sup> (<22.84)	770	79.9 (77.9 – 81.9)*	4.5 (4.2 – 4.7)*	9.1 (6.4 – 11.7)*	6.6 (5.8 – 7.4)*
2 <sup>nd</sup> (22.84–<28.05)	714	83.8 (82.2 – 85.5)	3.5 (3.3 – 3.8)*	6.7 (4.8 – 8.7)*	5.9 (5.3 – 6.5)*
3 <sup>rd</sup> (28.05–<33.0)	721	85.5 (83.9 – 87.1)	3.2 (2.9 – 3.4)*	5.9 (4.1 – 7.6)*	5.4 (5.0 – 5.9)*
4 <sup>th</sup> (33.0–<38.46)	744	87.4 (86.3 – 88.4)*	2.9 (2.6 – 3.1)*	4.7 (3.6 – 5.9)*	5.0 (4.6 – 5.5)*
5 <sup>th</sup> (38.46–<43.53)	713	88.6 (87.5 – 89.6)*	2.8 (2.5 – 3.0)*	4.2 (3.3 – 5.1)*	4.5 (4.1 – 4.9)*
6 <sup>th</sup> (43.53–<49.68)	734	88.7 (87.4 – 90.0)*	2.9 (2.6 – 3.3)*	4.1 (2.9 – 5.4)*	4.3 (3.8 – 4.7)*
7 <sup>th</sup> (49.68–<56.81)	735	89.2 (88.4 – 90.1)*	3.2 (2.5 – 3.8)*	3.7 (2.7 – 4.7)*	3.9 (3.5 – 4.3)*
8 <sup>th</sup> (56.81–<66.52)	786	90.2 (89.2 – 91.1)*	3.1 (2.6 – 3.5)*	3.2 (2.5 – 3.9)*	3.6 (3.2 – 4.0)*
9 <sup>th</sup> (66.52–<82.48)	804	90.1 (89.3 – 91.0)*	4.0 (3.5 – 4.6)*	2.9 (2.1 – 3.6)	3.0 (2.8 – 3.2)
10 <sup>th</sup> ( $\geq 82.45$ )	721	83.8 (81.9 – 85.7)	10.4 (8.9 – 12.0)	2.8 (2.2 – 3.4)	3.0 (2.7 – 3.2)

NHANES, National Health and Nutrition Examination Survey; 5-methylTHF, 5-methyltetrahydrofolate; UMFA, unmetabolized folic acid; MeFox, pyrazino-s-triazine derivative of 4 $\alpha$ -hydroxy-5-methylTHF.

<sup>a</sup> Serum folate forms and serum total folate (sum of all forms including MeFox) were measured by HPLC-MS/MS; non-methyl folate represents the sum of three minor forms: THF, 5-formylTHF, and 5,10-methenylTHF.

\*  $P < 0.05$  for tests comparing the mean percent of total folate in each decile to the 10<sup>th</sup> decile as a reference.

**Supplementary Table S4.** Spearman correlation between various folate biomarkers in the US population  $\geq 1$  year, NHANES 2011–2<sup>a</sup>

	<b>Serum non-methyl folate</b>	<b>Serum UMFA</b>	<b>Serum MeFox</b>	<b>Serum THF</b>	<b>Serum total folate</b>	<b>RBC total folate</b>
Persons $\geq 1$ year						
Serum 5-methylTHF	0.22*	0.44*	0.25*	0.22*	0.99*	0.59*
Serum non-methyl folate		0.12	0.05	1.00*	0.29*	0.14*
Serum UMFA			0.36*	0.11	0.50*	0.30*
Serum MeFox				0.05	0.31*	0.30*
Serum THF					0.29*	0.14*
Serum total folate						0.59*
Children 1–19 years						
Serum 5-methylTHF	0.22*	0.32*	0.14*	0.21*	0.97*	0.49*
Serum non-methyl folate		0.13	-0.02	1.00*	0.30*	0.06
Serum UMFA			0.36*	0.12	0.41*	0.22*
Serum MeFox				-0.01	0.21*	0.24*
Serum THF					0.29*	0.06
Serum total folate						0.48*
Adults 20–59 years						
Serum 5-methylTHF	0.22*	0.40*	0.27*	0.17*	0.99*	0.58*
Serum non-methyl folate		0.04	0.00	0.99*	0.24*	0.12*
Serum UMFA			0.33*	0.04	0.45*	0.26*
Serum MeFox				0.01	0.34*	0.26*
Serum THF					0.24*	0.12*
Serum total folate						0.59*
Older persons $\geq 60$ years						
Serum 5-methylTHF	0.22*	0.54*	0.28*	0.30*	0.99*	0.72*
Serum non-methyl folate		0.23*	0.20*	0.99*	0.37*	0.24*
Serum UMFA			0.43*	0.22*	0.60*	0.41*
Serum MeFox				0.19*	0.35*	0.33*
Serum THF					0.37*	0.24*
Serum total folate						0.71*

## Supplementary material

NHANES, National Health and Nutrition Examination Survey; UMFA, unmetabolized folic acid; MeFox, pyrazino-s-triazine derivative of 4 $\alpha$ -hydroxy-5-methylTHF; THF, tetrahydrofolate; RBC, red blood cell; 5-methylTHF, 5-methyltetrahydrofolate.

<sup>a</sup> Serum folate forms and serum total folate (sum of all forms including MeFox) were measured by HPLC-MS/MS; RBC total folate was measured by microbiologic assay; non-methyl folate represents the sum of three minor forms: THF, 5-formylTHF, and 5,10-methenylTHF.

\* Indicates significant correlation,  $P < 0.05$ .

**Supplementary Table S5.** Selected percentile concentrations of serum total folate excluding MeFox by demographic variable categories for the US population  $\geq 1$  year, NHANES 2011–2<sup>a</sup>

Variable categories	Sample size <i>n</i>	5 <sup>th</sup>	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>	95 <sup>th</sup>
nmol/L								
All	7442	17.5 (16.7–18.4)	21.4 (20.5–22.2)	28.9 (27.6–30.5)	41.7 (39.9–44.1)	59.1 (57.4–61.0)	80.0 (78.1–82.7)	94.0 (90.7–98.5)
All, fasted	3342	16.5 (15.4–17.5)	20.1 (19.3–21.1)	27.6 (26.3–28.9)	39.7 (38.1–41.4)	57.3 (54.4–59.8)	77.1 (74.1–80.4)	91.1 (85.5–97.8)
All, nonfasted	4100	18.7 (17.7–19.3)	22.3 (21.6–22.9)	30.4 (28.6–32.0)	44.1 (41.6–46.1)	60.8 (58.7–63.3)	83.0 (80.0–86.1)	96.9 (94.2–99.8)
Age, year								
1-5	563	29.2 (26.3–33.5)	35.5 (32.0–38.1)	46.4 (42.6–51.1)	59.8 (56.9–63.2)	77.5 (71.2–83.4)	93.2 (87.9–105)	106 (97.8–158)
1-5, fasted	76	23.1† (17.0–37.5)	32.5† (17.0–39.3)	42.8 (32.6–59.9)	65.6 (57.7–72.9)	81.0 (73.8–87.3)	94.2† (87.2–147)	108† (91.5–353)
1-5, nonfasted	487	29.7 (26.5–33.7)	35.6 (32.0–38.6)	46.4 (43.2–51.0)	59.7 (55.3–63.3)	77.5 (69.1–83.7)	93.1 (84.8–105)	105 (94.5–166)
6-11	953	32.6 (29.1–34.1)	36.9 (34.0–39.3)	46.8 (43.6–49.9)	59.9 (56.5–63.3)	73.4 (67.6–79.6)	90.7 (86.0–96.1)	99.8 (94.1–110)
6-11, fasted	228	31.7 (24.8–36.8)	36.7 (29.2–43.9)	51.1 (40.9–56.7)	63.5 (59.0–69.1)	79.5 (74.0–87.5)	95.7 (85.1–131)	102 (95.7–150)
6-11, nonfasted	725	32.7 (28.6–35.0)	36.9 (34.0–39.3)	46.1 (43.2–49.1)	58.8 (54.3–62.8)	70.6 (66.6–77.6)	89.1 (82.5–94.2)	97.6 (93.4–109)
12-19	1073	18.9 (17.7–20.0)	22.7 (21.3–23.7)	30.6 (28.2–32.5)	40.7 (39.1–43.1)	53.9 (50.2–61.1)	72.1 (66.6–79.8)	80.5 (75.4–88.2)
12-19, fasted	555	18.9 (16.5–20.4)	21.7 (19.7–23.4)	29.7 (27.6–31.6)	39.1 (38.0–41.2)	51.9 (49.1–55.4)	67.0 (61.7–78.3)	78.2 (70.2–92.7)
12-19, nonfasted	518	18.0 (15.1–21.8)	23.2 (21.3–26.0)	31.3 (28.1–35.4)	43.0 (39.2–47.6)	58.1 (51.9–64.7)	75.0 (69.0–82.7)	82.7 (76.7–89.9)
20-39	1730	16.4 (15.4–17.1)	19.8 (18.8–20.8)	26.1 (25.0–27.1)	36.3 (34.4–37.8)	49.2 (46.8–51.4)	63.9 (59.7–67.5)	76.5 (70.5–81.5)
20-39, fasted	907	16.0 (14.4–17.0)	19.1 (17.5–20.9)	25.9 (24.3–27.2)	35.4 (33.3–37.0)	48.7 (46.5–50.2)	63.1 (59.8–66.2)	74.1 (68.9–80.4)
20-39, nonfasted	823	16.8 (13.0–18.9)	20.5 (18.4–22.2)	26.4 (25.0–27.9)	37.2 (35.2–38.6)	50.0 (46.6–52.5)	65.7 (58.7–73.9)	77.6 (70.9–89.7)
40-59	1603	16.6 (15.3–17.9)	19.7 (18.6–20.7)	26.8 (25.1–28.8)	37.9 (35.2–40.5)	53.8 (50.1–57.2)	72.1 (67.5–76.5)	84.8 (77.7–98.8)
40-59, fasted	826	15.9 (13.4–17.4)	19.3 (17.0–20.6)	26.1 (24.4–28.5)	38.0 (34.1–41.4)	55.0 (51.1–59.0)	68.9 (66.1–76.1)	78.7 (75.3–86.7)
40-59, nonfasted	777	17.8 (16.6–18.5)	20.3 (18.7–21.9)	27.4 (25.6–29.4)	37.5 (35.1–41.5)	51.8 (48.3–56.8)	74.2 (65.3–89.1)	92.8 (81.1–111)
$\geq 60$	1520	18.8 (15.8–19.8)	22.3 (20.9–23.8)	31.7 (29.8–35.5)	50.7 (47.5–53.5)	75.5 (72.0–80.0)	99.8 (95.9–105)	115 (107–130)
$\geq 60$ , fasted	750	17.4 (14.7–19.2)	21.4 (19.4–24.3)	31.0 (27.3–36.0)	49.1 (44.5–54.0)	74.0 (64.4–85.5)	99.6 (92.7–111)	113 (103–138)
$\geq 60$ , nonfasted	770	19.6 (17.4–20.9)	22.4 (21.3–24.6)	32.4 (29.4–36.9)	51.8 (47.4–57.6)	77.3 (72.5–81.3)	102 (95.8–107)	116 (107–139)
Sex								
Males	3735	17.3 (16.2–18.2)	21.5 (20.2–22.3)	28.0 (26.7–29.5)	39.6 (37.8–42.0)	55.7 (53.1–58.4)	74.8 (71.7–78.6)	87.0 (84.6–90.7)
Males, fasted	1673	15.9 (14.8–16.8)	19.9 (18.7–21.4)	27.1 (25.7–28.3)	37.4 (34.6–39.3)	53.2 (49.9–57.2)	68.9 (66.5–74.3)	80.9 (77.4–86.6)
Males, nonfasted	2062	18.8 (16.8–20.6)	22.8 (21.6–23.7)	29.2 (27.1–31.3)	42.5 (39.6–45.3)	57.9 (54.6–61.7)	80.6 (74.9–84.2)	93.8 (86.8–99.0)
Females	3707	17.9 (17.0–18.7)	21.2 (20.1–22.2)	30.1 (28.4–32.0)	44.3 (41.8–46.2)	62.1 (59.7–65.6)	84.3 (80.1–90.5)	99.6 (95.0–104)
Females, fasted	1669	17.0 (15.7–18.6)	20.3 (19.2–22.3)	28.1 (26.4–30.6)	42.7 (40.2–45.8)	61.8 (57.2–65.7)	82.9 (78.0–92.0)	97.7 (92.1–108)
Females, nonfasted	2038	18.6 (17.5–19.2)	21.8 (20.7–22.6)	31.9 (30.3–33.5)	45.3 (43.3–47.6)	62.6 (60.3–66.8)	85.6 (80.0–91.1)	102 (96.7–106)



# Supplementary material

Race-ethnicity <sup>b</sup>								
Hispanic	1794	18.6 (16.7–20.5)	22.3 (21.0–23.1)	29.3 (27.4–31.3)	40.2 (37.7–42.8)	55.0 (52.8–57.7)	71.8 (69.5–74.4)	82.9 (78.8–89.0)
Hispanic, fasted	778	17.5 (15.5–20.1)	21.8 (19.5–23.0)	28.0 (26.2–29.8)	37.7 (35.0–40.2)	52.2 (49.2–54.8)	69.7 (67.0–74.5)	80.2 (77.8–84.3)
Hispanic, nonfasted	1016	19.6 (16.3–21.3)	22.7 (20.7–24.4)	31.2 (28.5–32.8)	42.7 (39.8–45.8)	57.5 (55.2–60.6)	72.8 (69.8–77.4)	86.2 (78.8–94.5)
MA	987	20.8 (20.3–21.8)	23.4 (22.3–24.9)	30.4 (28.3–32.3)	41.2 (38.1–44.8)	55.8 (52.8–59.1)	71.1 (68.4–74.7)	80.9 (76.2–88.6)
MA, fasted	431	20.5 (16.5–21.7)	23.1 (21.7–24.3)	29.2 (27.0–31.6)	38.6 (36.0–42.7)	53.9 (50.4–58.7)	72.2 (67.1–78.9)	80.0 (74.2–92.5)
MA, nonfasted	556	21.5 (20.2–22.7)	23.9 (22.4–26.6)	31.6 (28.3–35.0)	42.8 (39.5–46.7)	56.9 (52.3–62.3)	70.2 (67.6–75.1)	82.5 (74.6–90.1)
NHW	2397	18.2 (17.0–19.1)	22.1 (20.9–22.9)	30.3 (28.6–31.6)	44.4 (41.5–46.4)	61.7 (59.8–64.2)	84.2 (81.4–88.4)	98.6 (94.3–103)
NHW, fasted	1124	16.5 (14.8–18.5)	20.1 (19.3–21.8)	28.9 (27.3–30.5)	42.3 (39.7–45.2)	60.1 (57.4–62.7)	80.6 (76.2–87.7)	96.3 (90.1–104)
NHW, nonfasted	1273	19.2 (18.5–20.3)	23.2 (22.1–24.6)	31.6 (29.7–33.9)	45.7 (44.0–47.5)	63.6 (60.5–67.8)	87.0 (83.8–90.8)	99.9 (97.3–103)
NHB	2025	15.1 (13.8–16.2)	17.6 (16.4–18.9)	23.6 (22.2–25.1)	33.8 (31.6–36.0)	48.2 (45.5–52.2)	66.1 (62.6–71.3)	80.0 (76.4–82.3)
NHB, fasted	899	14.8 (13.4–16.2)	17.4 (15.7–18.9)	22.9 (21.5–24.4)	31.0 (28.7–33.2)	44.4 (41.0–49.0)	63.1 (57.9–69.7)	74.8 (71.5–79.7)
NHB, nonfasted	1126	15.3 (13.3–16.7)	17.7 (16.9–18.8)	24.2 (22.4–26.4)	37.2 (33.7–40.4)	51.5 (47.2–56.2)	70.2 (65.1–74.8)	82.9 (79.9–89.2)
NHA	944	16.8 (14.9–19.1)	20.8 (19.2–22.6)	28.4 (26.5–30.1)	41.0 (39.2–43.2)	59.4 (57.0–62.0)	78.2 (74.0–82.4)	89.6 (82.7–96.4)
NHA, fasted	439	15.9 (13.1–18.5)	19.8 (17.6–21.1)	26.0 (23.9–28.4)	37.8 (35.5–40.7)	56.9 (52.3–63.3)	77.2 (69.5–83.6)	86.0 (79.8–96.4)
NHA, unfasted	505	18.6 (16.1–20.7)	22.9 (20.0–24.5)	30.3 (27.9–32.8)	43.5 (41.8–47.0)	61.6 (58.4–64.8)	79.5 (75.2–86.0)	91.8 (86.6–104)

MeFox, pyrazino-s-triazine derivative of 4 $\alpha$ -hydroxy-5-methylTHF; NHANES, National Health and Nutrition Examination Survey; MA, Mexican American; NHW, non-Hispanic White; NHB, non-Hispanic Black; NHA, non-Hispanic Asian.

<sup>a</sup> Values are percentiles (95% CI) and were measured by HPLC-MS/MS; “fasted” refers to no food intake for past  $\geq 8$  hours; “nonfasted” refers to food intake during the last 8 hours.

<sup>b</sup> Hispanic subgroup represents the sum of Mexican American and other Hispanic ethnicity (not shown).

† Estimate is subject to greater uncertainty due to small sample size ( $n < 224$ ).

**Supplementary Table S6.** Selected percentile concentrations of serum total folate including MeFox by demographic variable categories for the US population  $\geq 1$  year, NHANES 2011–2<sup>a</sup>

Variable categories	Sample size <i>n</i>	5 <sup>th</sup>	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>	95 <sup>th</sup>
nmol/L								
All	7442	18.9 (17.8–19.6)	22.8 (22.0–23.6)	30.6 (29.0–32.0)	43.5 (41.8–46.1)	61.2 (59.3–62.7)	82.5 (80.3–85.7)	96.6 (93.7–101)
All, fasted	3342	17.3 (16.3–18.4)	21.3 (20.4–22.2)	28.8 (27.2–30.5)	41.1 (39.3–43.0)	58.8 (55.9–61.7)	78.9 (75.9–81.8)	93.9 (87.5–99.9)
All, nonfasted	4100	20.2 (19.3–21.1)	24.2 (23.4–25.3)	32.5 (30.8–34.3)	46.3 (43.9–48.4)	62.7 (60.9–65.9)	86.2 (83.7–88.4)	99.7 (96.4–103)
Age, year								
1-5	563	29.9 (26.8–34.6)	36.8 (32.8–40.0)	48.1 (43.7–52.3)	61.3 (58.5–65.2)	78.5 (72.8–85.6)	96.8 (89.2–106)	107 (101–161)
1-5, fasted	76	23.3† (17.2–37.1)	33.0† (17.2–40.3)	43.8 (33.1–60.9)	66.9 (57.9–74.9)	81.5 (75.1–88.4)	95.0† (88.1–148)	109† (96.8–223)
1-5, nonfasted	487	30.3 (27.4–35.1)	36.8 (32.7–40.1)	48.1 (44.2–52.1)	60.9 (57.5–65.2)	78.0 (71.2–86.1)	96.3 (87.5–107)	107 (99.6–167)
6-11	953	34.0 (30.3–35.6)	39.0 (35.2–40.9)	48.6 (45.4–51.4)	61.8 (58.1–65.0)	75.2 (70.2–80.8)	91.7 (87.2–97.2)	102 (94.8–117)
6-11, fasted	228	32.2 (25.0–37.5)	37.4 (29.7–44.2)	51.6 (41.9–57.2)	64.1 (59.8–69.7)	80.1 (74.6–88.1)	96.4 (86.0–132)	104 (93.7–152)
6-11, nonfasted	725	34.5 (30.0–36.9)	39.4 (36.4–40.8)	47.9 (44.7–50.6)	61.2 (56.3–64.8)	73.0 (69.1–79.6)	90.6 (86.0–96.0)	101 (94.8–111)
12-19	1073	20.4 (18.3–21.8)	24.0 (22.4–25.4)	31.9 (30.1–33.7)	42.2 (40.8–45.0)	55.6 (51.6–62.6)	73.9 (68.2–81.2)	82.2 (78.6–89.7)
12-19, fasted	555	20.2 (16.8–21.6)	22.6 (21.1–24.5)	30.9 (28.6–32.7)	40.5 (38.4–42.3)	53.0 (50.1–57.2)	68.8 (63.2–77.0)	79.2 (70.9–93.9)
12-19, nonfasted	518	20.9 (12.0–25.5)	25.7 (22.2–27.7)	33.1 (30.3–37.1)	45.3 (41.4–49.5)	60.2 (54.1–67.7)	77.1 (71.0–86.6)	86.0 (80.0–92.3)
20-39	1730	17.5 (16.8–18.2)	21.4 (20.1–22.1)	27.6 (26.6–28.5)	37.9 (36.2–39.6)	50.9 (48.5–53.4)	65.7 (62.1–70.1)	78.8 (73.3–84.5)
20-39, fasted	907	17.0 (14.9–18.0)	20.6 (18.3–21.9)	27.0 (25.2–28.3)	36.3 (34.4–39.0)	49.9 (48.2–51.1)	64.4 (61.9–67.5)	75.5 (70.1–81.6)
20-39, nonfasted	823	18.3 (16.6–19.5)	21.9 (19.7–23.7)	28.4 (26.6–29.5)	39.5 (37.7–40.9)	52.2 (48.8–54.8)	68.2 (60.9–76.5)	82.6 (73.7–92.1)
40-59	1603	17.6 (16.5–19.1)	21.1 (19.9–22.8)	28.5 (26.5–30.8)	39.5 (37.4–42.6)	55.8 (52.0–59.6)	74.1 (69.2–80.2)	87.8 (80.3–100)
40-59, fasted	826	16.3 (14.0–17.9)	20.2 (17.6–22.7)	27.5 (25.8–30.0)	39.3 (35.6–43.0)	56.6 (52.3–60.6)	71.5 (67.7–77.3)	80.5 (76.4–96.6)
40-59, nonfasted	777	19.2 (17.4–19.9)	22.5 (20.0–23.8)	29.6 (26.7–32.1)	39.7 (37.5–43.9)	55.2 (50.9–59.4)	78.3 (68.1–92.7)	94.8 (83.8–114)
$\geq 60$	1520	20.3 (18.1–21.2)	24.4 (22.9–25.2)	34.3 (31.8–37.2)	53.1 (49.8–56.5)	79.0 (74.2–83.3)	102 (99.3–106)	120 (110–136)
$\geq 60$ , fasted	750	18.3 (15.1–20.5)	23.1 (20.5–25.2)	32.8 (28.6–37.2)	51.0 (46.9–55.9)	76.1 (66.6–87.9)	101 (94.9–112)	117 (105–143)
$\geq 60$ , nonfasted	770	21.7 (20.3–22.9)	24.9 (23.3–27.5)	35.6 (33.1–38.6)	55.7 (50.3–59.0)	80.8 (76.0–86.0)	104 (99.4–112)	120 (113–143)
Sex								
Males	3735	18.3 (17.2–19.3)	22.8 (21.7–23.8)	29.9 (28.2–31.3)	41.5 (39.4–43.7)	57.7 (55.2–60.5)	77.3 (73.8–80.9)	90.6 (87.5–94.0)
Males, fasted	1673	16.8 (15.9–17.8)	21.1 (19.3–22.3)	28.2 (26.7–29.9)	39.0 (35.9–41.0)	54.7 (51.6–58.6)	70.7 (67.7–77.2)	81.9 (78.8–88.9)
Males, nonfasted	2062	20.4 (18.4–22.1)	24.8 (23.3–25.9)	31.4 (29.2–33.5)	44.5 (41.4–47.9)	60.2 (57.0–63.4)	83.7 (78.2–87.8)	95.3 (90.4–103)
Females	3707	19.4 (18.0–20.0)	22.9 (21.8–23.7)	31.9 (29.9–33.9)	46.4 (43.9–48.1)	64.2 (62.0–67.5)	87.1 (82.7–93.5)	101 (98.2–106)
Females, fasted	1669	17.8 (16.6–19.9)	21.7 (20.3–23.5)	29.7 (27.3–31.9)	44.3 (41.2–47.4)	62.8 (58.7–67.4)	85.5 (79.6–94.1)	99.9 (94.3–108)
Females, nonfasted	2038	20.2 (19.4–20.9)	23.6 (22.9–24.5)	34.3 (32.0–35.9)	47.8 (45.5–50.2)	65.7 (62.7–69.5)	88.4 (83.8–94.8)	102 (99.1–107)

# Supplementary material

Race-ethnicity <sup>b</sup>								
Hispanic	1794	19.3 (17.5–21.6)	23.6 (22.3–24.5)	30.5 (28.9–32.6)	41.6 (39.6–44.4)	56.9 (54.7–59.5)	73.8 (71.4–76.3)	84.1 (80.7–90.5)
MA	987	22.1 (21.1–23.1)	24.9 (23.7–25.8)	31.9 (29.6–33.7)	42.8 (39.9–46.0)	57.8 (54.5–61.1)	73.3 (70.1–77.5)	82.0 (78.7–88.8)
MA, fasted	431	21.1 (17.5–22.6)	24.0 (22.9–25.3)	30.5 (28.0–32.6)	39.9 (37.0–43.2)	55.0 (51.5–60.1)	73.5 (68.5–79.7)	81.0 (76.4–93.4)
MA, nonfasted	556	22.9 (20.0–24.3)	25.6 (23.8–28.3)	33.3 (29.3–37.4)	44.6 (41.1–49.0)	60.1 (55.5–64.5)	72.8 (69.7–77.6)	84.0 (77.5–93.3)
NHW	2397	19.6 (18.2–20.3)	23.8 (23.1–24.5)	31.9 (30.7–33.4)	46.4 (43.8–48.2)	63.5 (61.9–66.6)	87.4 (84.5–90.7)	101 (98.1–105)
NHW, fasted	1124	17.6 (15.8–19.9)	21.8 (20.3–23.6)	30.5 (28.6–31.6)	43.5 (41.2–46.8)	62.2 (59.2–64.3)	81.9 (77.8–90.8)	98.9 (92.0–106)
NHW, nonfasted	1273	21.4 (20.4–22.5)	25.8 (24.4–26.3)	34.0 (32.0–36.1)	48.2 (46.2–50.2)	66.5 (62.6–70.1)	90.5 (87.2–94.6)	103 (101–107)
NHB	2025	16.5 (14.5–17.2)	18.8 (17.8–19.8)	24.8 (23.3–26.5)	35.1 (32.9–37.6)	50.1 (47.4–54.3)	68.6 (64.7–72.3)	82.1 (79.0–85.1)
NHB, fasted	899	16.0 (14.3–16.8)	18.1 (16.9–19.6)	23.9 (22.3–25.6)	32.2 (29.5–34.5)	46.4 (42.3–50.2)	64.2 (59.2–70.8)	75.7 (72.4–81.2)
NHB, nonfasted	1126	16.6 (14.5–17.8)	19.3 (18.2–20.6)	25.7 (24.0–28.2)	39.0 (35.4–42.2)	53.3 (49.2–58.0)	72.0 (67.8–77.3)	85.9 (82.2–90.8)
NHA	944	18.3 (17.1–20.0)	22.4 (20.7–23.8)	30.5 (28.6–32.4)	43.3 (41.7–45.1)	61.9 (59.6–65.0)	80.9 (77.0–86.1)	91.6 (86.7–97.9)
NHA, fasted	439	17.2 (13.4–19.6)	20.6 (18.0–22.1)	26.9 (25.1–29.6)	38.9 (36.5–42.0)	58.9 (53.6–64.0)	78.6 (71.2–85.9)	87.5 (81.2–98.0)
NHA, unfasted	505	19.9 (17.6–23.4)	25.1 (22.2–27.5)	33.2 (31.2–35.7)	46.2 (44.1–49.5)	65.1 (61.9–67.0)	81.9 (79.4–87.5)	95.3 (90.9–105)

MeFox, pyrazino-s-triazine derivative of 4 $\alpha$ -hydroxy-5-methylTHF; NHANES, National Health and Nutrition Examination Survey; MA, Mexican American; NHW, non-Hispanic White; NHB, non-Hispanic Black; NHA, non-Hispanic Asian.

<sup>a</sup> Values are percentiles (95% CI) and were measured by HPLC-MS/MS; “fasted” refers to no food intake for past  $\geq 8$  hours; “nonfasted” refers to food intake during the last 8 hours.

<sup>b</sup> Hispanic subgroup represents the sum of Mexican American and other Hispanic ethnicity (not shown).

† Estimate is subject to greater uncertainty due to small sample size ( $n < 224$ ).

**Supplementary Table S7.** Selected percentile concentration of red blood cell total folate by demographic variable categories for the US population  $\geq 1$  year, NHANES 2011–2<sup>a</sup>

Variable categories	Sample size <i>n</i>	5 <sup>th</sup>	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>	95 <sup>th</sup>
nmol/L								
All	7867	543 (527–563)	637 (607–664)	811 (774–845)	1050 (1010–1090)	1340 (1290–1400)	1720 (1660–1820)	2020 (1920–2140)
All, fasted	3479	553 (529–573)	636 (610–664)	807 (760–843)	1050 (1010–1090)	1360 (1310–1410)	1770 (1660–1900)	2060 (1960–2200)
All, nonfasted	4388	542 (519–563)	637 (596–670)	814 (782–849)	1050 (1010–1090)	1330 (1260–1400)	1710 (1620–1800)	1940 (1840–2120)
Age, year								
1-5	708	634 (589–663)	725 (634–776)	867 (800–908)	1030 (982–1090)	1230 (1200–1280)	1480 (1370–1630)	1660 (1510–1860)
1-5, fasted	88	440† (217–609)	608† (217–723)	758 (721–779)	970 (865–1040)	1140 (1070–1240)	1310† (1230–1430)	1360† (1310–1930)
1-5, nonfasted	620	650 (581–703)	735 (650–793)	882 (813–942)	1030 (996–1100)	1240 (1200–1290)	1500 (1370–1670)	1680 (1550–1810)
6-11	1044	678 (592–712)	742 (710–770)	892 (854–918)	1070 (1030–1090)	1260 (1210–1320)	1490 (1440–1560)	1630 (1570–1700)
6-11, fasted	251	612 (511–716)	728 (655–771)	852 (799–911)	1020 (950–1120)	1230 (1140–1350)	1420 (1360–1510)	1520 (1470–1610)
6-11, nonfasted	793	691 (619–713)	745 (713–769)	906 (866–938)	1070 (1040–1100)	1270 (1220–1330)	1520 (1440–1630)	1670 (1580–1820)
12-19	1127	500 (473–546)	595 (551–636)	752 (718–793)	939 (887–995)	1170 (1120–1230)	1380 (1350–1470)	1580 (1470–1720)
12-19, fasted	585	491 (461–555)	587 (531–640)	746 (710–785)	922 (882–971)	1150 (1110–1210)	1360 (1320–1470)	1550 (1450–1680)
12-19, nonfasted	542	507 (451–565)	604 (542–657)	770 (698–828)	966 (913–1030)	1200 (1110–1270)	1400 (1350–1540)	1600 (1490–1720)
20-39	1762	521 (480–551)	597 (564–638)	761 (733–790)	976 (937–1010)	1210 (1170–1270)	1520 (1430–1630)	1720 (1610–1850)
20-39, fasted	931	537 (479–572)	615 (570–652)	758 (720–796)	968 (921–1020)	1210 (1170–1270)	1510 (1430–1630)	1710 (1620–1890)
20-39, nonfasted	831	494 (467–534)	584 (544–627)	768 (733–796)	979 (938–1030)	1210 (1160–1310)	1530 (1400–1720)	1710 (1570–1880)
40-59	1655	540 (522–562)	626 (585–663)	811 (751–852)	1070 (1010–1140)	1370 (1300–1440)	1760 (1650–1910)	2050 (1920–2260)
40-59, fasted	847	540 (519–573)	627 (586–669)	833 (760–874)	1090 (1010–1170)	1400 (1330–1460)	1840 (1660–1980)	2080 (1920–2340)
40-59, nonfasted	808	540 (523–562)	614 (563–663)	799 (727–850)	1050 (965–1140)	1340 (1240–1460)	1700 (1590–1920)	1990 (1810–2340)
$\geq 60$	1571	597 (547–628)	702 (670–734)	931 (888–978)	1270 (1210–1320)	1710 (1600–1860)	2180 (2000–2550)	2650 (2410–3050)
$\geq 60$ , fasted	777	626 (599–642)	721 (664–756)	938 (867–998)	1270 (1210–1380)	1690 (1520–1920)	2170 (1950–2710)	2720 (2250–3600)
$\geq 60$ , nonfasted	794	545 (513–597)	677 (612–739)	910 (852–984)	1260 (1170–1320)	1720 (1630–1810)	2180 (1990–2560)	2620 (2480–2850)
Sex								
Males	3944	542 (522–567)	632 (595–665)	801 (752–841)	1030 (995–1070)	1310 (1250–1380)	1660 (1560–1790)	1880 (1820–1960)
Males, fasted	1739	537 (510–566)	624 (602–656)	790 (746–829)	1030 (995–1070)	1320 (1260–1380)	1650 (1540–1860)	1930 (1860–2070)
Males, nonfasted	2205	546 (509–584)	638 (583–676)	810 (760–857)	1030 (988–1080)	1300 (1220–1400)	1660 (1550–1780)	1840 (1740–1970)
Females	3923	547 (524–564)	644 (618–673)	823 (791–850)	1070 (1030–1110)	1370 (1320–1440)	1800 (1720–1910)	2140 (2000–2320)
Females, fasted	1740	560 (539–581)	650 (625–677)	826 (777–868)	1080 (1030–1120)	1410 (1340–1480)	1870 (1740–2020)	2190 (2060–2300)
Females, nonfasted	2183	535 (507–556)	634 (597–676)	820 (795–844)	1060 (1030–1110)	1350 (1290–1420)	1750 (1670–1870)	2080 (1910–2380)

# Supplementary material

Race-ethnicity <sup>b</sup>								
Hispanic	1919	538 (502–567)	623 (594–654)	773 (753–793)	965 (941–992)	1200 (1150–1240)	1460 (1410–1530)	1670 (1600–1760)
Hispanic, fasted	819	536 (486–563)	608 (569–656)	758 (733–782)	943 (907–986)	1210 (1140–1250)	1460 (1410–1540)	1690 (1600–1830)
Hispanic, nonfasted	1100	551 (496–583)	640 (577–686)	787 (755–824)	982 (955–1010)	1190 (1150–1250)	1460 (1410–1520)	1640 (1580–1730)
MA	1071	576 (550–610)	667 (639–695)	785 (759–814)	963 (921–1000)	1200 (1150–1260)	1440 (1390–1530)	1610 (1530–1810)
MA, fasted	462	563 (502–621)	672 (618–711)	780 (757–807)	935 (899–999)	1210 (1120–1260)	1440 (1360–1600)	1700 (1530–2020)
MA, nonfasted	609	581 (558–608)	659 (611–696)	792 (747–842)	977 (935–1020)	1190 (1150–1270)	1450 (1380–1530)	1580 (1500–1750)
NHW	2471	587 (562–611)	683 (653–707)	866 (832–915)	1120 (1080–1170)	1430 (1370–1520)	1850 (1750–1940)	2180 (2020–2350)
NHW, fasted	1150	610 (578–629)	691 (667–711)	870 (833–918)	1150 (1110–1180)	1460 (1390–1540)	1900 (1830–2020)	2210 (2070–2350)
NHW, nonfasted	1321	565 (533–607)	670 (628–712)	857 (815–920)	1100 (1050–1160)	1410 (1340–1530)	1790 (1710–1940)	2110 (1930–2460)
NHB	2185	452 (422–475)	517 (491–545)	661 (639–681)	855 (824–891)	1110 (1060–1160)	1440 (1340–1530)	1680 (1590–1750)
NHB, fasted	948	434 (408–479)	508 (481–534)	646 (620–667)	829 (800–859)	1060 (1030–1130)	1430 (1300–1540)	1690 (1540–1870)
NHB, nonfasted	1237	460 (440–476)	528 (490–552)	676 (652–698)	887 (840–927)	1140 (1080–1200)	1450 (1340–1550)	1670 (1570–1800)
NHA	999	503 (459–537)	589 (544–629)	751 (714–785)	945 (913–999)	1210 (1160–1280)	1510 (1410–1670)	1750 (1660–1880)
NHA, fasted	457	492 (439–517)	558 (504–608)	714 (678–753)	921 (868–997)	1170 (1100–1280)	1430 (1360–1660)	1680 (1550–1860)
NHA, unfasted	542	534 (460–572)	633 (550–676)	778 (740–816)	962 (924–1030)	1250 (1180–1310)	1580 (1470–1750)	1780 (1690–1910)

NHANES, National Health and Nutrition Examination Survey; MA, Mexican American; NHW, non-Hispanic White; NHB, non-Hispanic Black; NHA, non-Hispanic Asian.

<sup>a</sup> Values are percentiles (95% CI) and were measured by microbiologic assay; “fasted” refers to no food intake for past  $\geq 8$  hours; “nonfasted” refers to food intake during the last 8 hours.

<sup>b</sup> Hispanic subgroup represents the sum of Mexican American and other Hispanic ethnicity (not shown).

† Estimate is subject to greater uncertainty due to small sample size ( $n < 224$ ).

**Supplementary Table S8.** Selected percentile concentrations of serum 5-methyltetrahydrofolate by demographic variable categories for the US population  $\geq 1$  year, NHANES 2011–2<sup>a</sup>

Variable categories	Sample size <i>n</i>	5 <sup>th</sup>	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>	95 <sup>th</sup>
nmol/L								
All	7454	14.7 (13.8–15.9)	18.5 (17.7–19.4)	26.1 (24.7–27.7)	38.5 (36.7–40.5)	54.7 (52.8–57.1)	72.7 (70.8–75.2)	84.7 (80.9–89.6)
All, fasted	3345	14.1 (13.5–14.6)	17.7 (16.7–18.3)	24.9 (23.4–26.2)	36.9 (35.1–38.9)	54.0 (51.4–56.9)	72.3 (68.4–77.3)	86.8 (79.0–94.1)
All, nonfasted	4109	15.7 (14.2–16.9)	19.6 (18.7–20.6)	27.7 (25.5–29.3)	40.1 (37.5–42.4)	55.6 (53.5–58.4)	73.6 (71.4–75.3)	82.8 (80.8–86.9)
Age, year								
1-5	568	26.9 (23.0–30.2)	32.5 (28.1–34.9)	41.5 (37.7–46.8)	54.2 (50.6–56.9)	70.3 (66.2–75.2)	83.8 (81.1–87.0)	94.8 (86.7–109)
1-5, fasted	76	21.7† (12.3–31.7)	29.8† (12.3–37.8)	40.5 (29.8–56.0)	60.7 (51.7–69.2)	77.4 (68.5–81.8)	84.8† (81.2–105)	94.6† (84.3–108)
1-5, nonfasted	492	27.0 (23.4–30.8)	32.5 (28.1–34.9)	41.5 (37.7–46.1)	53.2 (49.8–56.6)	69.6 (65.1–75.2)	83.6 (79.9–87.8)	94.1 (86.0–116)
6-11	955	30.3 (24.8–31.8)	33.4 (30.9–35.4)	42.7 (39.0–46.2)	55.6 (51.2–59.4)	66.5 (63.1–70.8)	80.5 (76.0–87.0)	89.2 (84.5–96.8)
6-11, fasted	229	29.1 (21.3–32.4)	33.1 (26.3–40.9)	47.6 (38.7–52.4)	60.2 (56.8–64.8)	75.5 (66.9–88.3)	90.7 (79.1–134)	98.8 (90.7–144)
6-11, nonfasted	726	30.4 (24.7–31.8)	33.4 (31.0–35.1)	42.0 (38.6–45.3)	54.5 (49.3–58.0)	64.2 (61.9–67.8)	76.8 (72.8–83.4)	85.4 (80.2–91.9)
12-19	1073	16.3 (14.4–18.3)	20.0 (18.6–21.5)	28.0 (25.2–30.4)	38.1 (36.6–39.8)	50.1 (46.9–57.1)	66.5 (61.5–72.0)	74.3 (70.8–83.0)
12-19, fasted	555	16.5 (14.5–17.9)	18.9 (17.3–20.4)	27.0 (24.2–29.3)	36.8 (34.1–38.7)	48.9 (46.1–52.5)	64.5 (57.6–75.6)	75.4 (66.6–89.3)
12-19, nonfasted	518	16.2 (12.9–19.6)	21.1 (18.7–23.2)	28.7 (25.0–32.2)	39.7 (36.1–44.2)	53.2 (47.0–59.6)	68.2 (61.5–74.1)	74.1 (70.8–82.4)
20-39	1730	13.6 (12.1–14.3)	17.1 (15.9–18.2)	23.1 (22.2–24.1)	33.5 (31.5–35.0)	45.2 (43.4–47.4)	58.9 (55.5–62.3)	67.6 (63.8–73.6)
20-39, fasted	907	13.7 (11.4–14.4)	16.7 (15.5–17.7)	23.0 (21.0–24.2)	32.1 (30.8–34.4)	45.0 (43.2–47.1)	59.1 (55.5–61.4)	67.7 (63.7–74.4)
20-39, nonfasted	823	13.5 (11.7–15.3)	18.0 (15.5–19.2)	23.3 (22.1–25.0)	34.4 (32.1–35.9)	45.3 (42.7–48.8)	58.8 (54.3–63.5)	67.5 (62.6–75.2)
40-59	1604	14.3 (12.9–15.3)	17.2 (15.5–18.6)	24.3 (22.5–26.0)	35.0 (32.6–37.1)	50.3 (46.2–53.3)	64.9 (62.1–69.1)	76.0 (72.1–81.2)
40-59, fasted	827	13.6 (11.2–14.9)	16.5 (14.4–18.3)	23.2 (21.8–25.8)	35.3 (31.9–38.8)	52.2 (48.3–55.1)	65.6 (62.8–69.9)	73.6 (68.6–83.4)
40-59, nonfasted	777	15.0 (14.0–15.7)	17.6 (15.6–19.6)	24.9 (23.4–26.8)	34.9 (32.5–37.1)	47.6 (44.5–51.4)	63.5 (57.2–75.5)	78.9 (70.4–92.2)
$\geq 60$	1524	15.3 (13.3–16.9)	19.6 (18.3–20.7)	28.8 (26.4–31.8)	46.7 (44.2–49.3)	70.1 (65.9–73.8)	91.6 (87.3–97.1)	102 (97.1–116)
$\geq 60$ , fasted	751	14.1 (12.5–16.7)	18.4 (17.5–20.8)	28.1 (25.0–33.0)	45.2 (41.4–51.1)	71.0 (61.5–81.2)	95.2 (88.1–103)	104 (97.6–140)
$\geq 60$ , nonfasted	773	16.7 (13.2–18.2)	20.0 (18.4–22.1)	29.4 (26.4–33.8)	48.0 (44.2–52.2)	68.8 (66.6–72.3)	87.8 (83.0–92.0)	99.6 (94.0–102)
Sex								
Males	3739	14.5 (13.6–16.0)	18.8 (17.7–19.9)	25.2 (23.8–26.9)	36.4 (34.5–38.6)	51.7 (49.3–54.3)	67.2 (65.1–70.8)	79.2 (76.8–81.4)
Males, fasted	1674	13.7 (11.9–14.4)	17.5 (16.1–18.5)	24.2 (22.4–26.1)	34.4 (32.0–36.4)	50.4 (46.4–54.0)	65.1 (62.5–69.4)	76.3 (71.5–83.7)
Males, nonfasted	2065	16.3 (14.3–17.8)	20.3 (18.8–21.2)	26.0 (24.5–28.1)	38.6 (36.0–41.5)	53.2 (50.1–55.8)	70.4 (66.1–75.5)	81.2 (76.8–86.9)
Females	3715	15.0 (13.9–16.0)	18.3 (17.5–19.5)	27.3 (25.7–29.1)	40.6 (38.5–43.2)	57.9 (55.5–60.6)	76.7 (73.9–80.1)	90.2 (85.5–95.2)
Females, fasted	1671	14.4 (12.9–16.0)	17.7 (16.7–18.7)	25.6 (23.9–27.3)	39.3 (37.7–42.5)	58.5 (54.1–61.8)	78.4 (72.7–87.4)	91.8 (87.1–102)
Females, nonfasted	2044	15.4 (13.9–16.8)	19.2 (18.1–20.2)	29.1 (27.2–31.4)	41.8 (38.9–44.2)	57.9 (56.3–60.4)	75.2 (73.1–78.2)	85.8 (80.9–92.3)

# Supplementary material

Race-ethnicity <sup>b</sup>								
Hispanic	1798	15.7 (14.1–16.8)	19.3 (18.2–20.3)	26.6 (24.3–28.4)	37.0 (34.5–39.3)	50.8 (48.6–52.9)	65.9 (64.2–68.2)	75.9 (71.8–78.9)
Hispanic, fasted	779	15.3 (12.1–16.7)	19.1 (16.6–20.2)	25.0 (23.1–27.3)	34.6 (32.4–37.2)	48.6 (45.4–52.3)	65.6 (63.0–69.8)	76.4 (70.6–81.4)
Hispanic, nonfasted	1019	16.0 (13.8–17.8)	19.5 (17.8–21.6)	27.9 (25.0–30.4)	38.9 (36.2–41.6)	52.4 (50.0–54.7)	66.2 (64.1–68.5)	74.8 (71.3–80.2)
MA	989	17.9 (15.7–19.1)	20.8 (18.8–22.3)	27.8 (24.9–30.1)	38.1 (34.2–41.7)	52.0 (48.6–55.4)	65.7 (63.7–70.4)	76.0 (70.3–82.3)
MA, fasted	432	17.1 (14.3–19.0)	20.1 (19.0–21.0)	26.7 (24.2–28.7)	35.8 (32.7–39.1)	50.6 (46.2–56.2)	67.4 (63.7–73.8)	76.5 (70.4–84.0)
MA, nonfasted	557	18.4 (13.7–20.5)	21.3 (18.7–23.5)	28.3 (23.5–33.2)	39.7 (35.5–43.5)	52.8 (48.5–57.4)	64.8 (62.1–68.2)	74.4 (67.7–82.9)
NHW	2401	15.6 (14.0–16.8)	19.5 (18.4–20.5)	27.7 (26.0–29.0)	40.9 (38.4–43.3)	57.6 (55.5–59.8)	76.3 (74.1–79.3)	90.2 (85.0–94.4)
NHW, fasted	1126	14.3 (13.6–15.1)	17.9 (17.3–19.3)	26.2 (24.9–27.7)	39.3 (37.2–42.3)	56.9 (54.1–59.8)	76.5 (70.8–84.6)	91.1 (84.6–98.2)
NHW, nonfasted	1275	16.8 (15.5–18.3)	20.8 (19.7–22.3)	28.8 (27.1–31.4)	42.2 (39.4–44.3)	58.5 (55.7–61.4)	76.1 (74.9–78.5)	87.1 (83.3–92.3)
NHB	2025	12.4 (11.3–13.0)	14.8 (13.9–15.5)	20.4 (19.3–21.5)	30.2 (27.6–32.2)	43.9 (41.1–47.5)	59.2 (56.8–63.1)	71.1 (68.2–74.6)
NHB, fasted	899	11.8 (10.7–13.1)	14.7 (13.3–15.6)	19.8 (18.3–21.0)	27.2 (25.8–29.9)	40.9 (36.8–45.4)	57.4 (53.9–63.9)	69.9 (64.6–74.1)
NHB, nonfasted	1126	12.6 (11.4–13.5)	14.9 (13.9–16.0)	20.9 (19.9–22.7)	32.6 (29.9–36.2)	45.4 (42.4–49.9)	60.9 (57.1–66.3)	73.0 (68.4–78.2)
NHA	947	14.6 (11.6–17.0)	18.2 (17.0–19.5)	25.4 (23.8–28.0)	38.1 (36.7–40.3)	55.6 (53.4–58.9)	73.9 (69.0–77.1)	81.1 (77.0–87.5)
NHA, fasted	439	13.7 (10.6–16.5)	17.3 (15.4–18.5)	23.2 (21.2–26.2)	34.6 (32.1–38.7)	54.3 (49.7–59.1)	72.6 (66.6–79.4)	82.3 (76.0–90.4)
NHA, unfasted	508	16.2 (12.1–17.7)	20.2 (17.7–21.5)	28.0 (25.3–30.6)	40.9 (38.7–43.8)	57.0 (53.7–60.3)	74.4 (69.9–77.0)	78.8 (76.9–85.5)

NHANES, National Health and Nutrition Examination Survey; MA, Mexican American; NHW, non-Hispanic White; NHB, non-Hispanic Black; NHA, non-Hispanic Asian.

<sup>a</sup> Values are percentiles (95% CI) and were measured by microbiologic assay; “fasted” refers to no food intake for past  $\geq 8$  hours; “nonfasted” refers to food intake during the last 8 hours.

<sup>b</sup> Hispanic subgroup represents the sum of Mexican American and other Hispanic ethnicity (not shown).

† Estimate is subject to greater uncertainty due to small sample size ( $n < 224$ ).

**Supplementary Table S9.** Selected percentile concentrations of serum unmetabolized folic acid by demographic variable categories for the US population  $\geq 1$  year, NHANES 2011–2<sup>a</sup>

Variable categories	Sample size <i>n</i>	5 <sup>th</sup>	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>	95 <sup>th</sup>
		nmol/L						
All	7462	.487 (.440–.524)	.573 (.529–.616)	.750 (.708–.787)	.991 (.955–1.03)	1.43 (1.36–1.52)	2.93 (2.72–3.31)	7.62 (7.00–9.50)
All, fasted	3346	.458 (.402–.500)	.545 (.496–.581)	.690 (.644–.738)	.911 (.866–.954)	1.21 (1.15–1.27)	1.72 (1.61–1.87)	2.47 (2.27–2.79)
All, nonfasted	4116	.517 (.469–.561)	.620 (.560–.678)	.813 (.782–.845)	1.11 (1.05–1.16)	1.81 (1.68–1.99)	6.10 (5.26–7.03)	13.7 (11.6–18.3)
Age, year								
1-5	573	.530 (.478–.570)	.642 (.534–.704)	.805 (.751–.880)	1.16 (1.06–1.39)	2.42 (1.89–3.29)	10.9 (5.62–15.5)	18.2 (12.1–41.4)
1-5, fasted	77	.456† (.371–.488)	.500† (.379–.542)	.695 (.493–.789)	.859 (.727–1.04)	1.12 (.947–1.85)	2.32† (1.20–282)	4.57† (2.23–282)
1-5, nonfasted	496	.545 (.392–.650)	.671 (.556–.736)	.831 (.780–.911)	1.25 (1.10–1.57)	2.61 (2.20–4.06)	11.1 (6.88–17.1)	18.4 (12.1–44.5)
6-11	957	.566 (.482–.633)	.673 (.589–.731)	.839 (.784–.914)	1.16 (1.10–1.27)	1.83 (1.62–2.16)	6.73 (3.92–12.1)	17.4 (10.3–30.2)
6-11, fasted	229	.539 (.370–.597)	.619 (.543–.671)	.738 (.672–.803)	.875 (.817–.941)	1.07 (.972–1.24)	1.51 (1.24–1.88)	1.69 (1.53–8.40)
6-11, nonfasted	728	.588 (.455–.664)	.699 (.589–.774)	.923 (.815–1.03)	1.30 (1.23–1.41)	2.24 (1.77–3.55)	8.67 (4.93–18.3)	21.6 (13.0–35.1)
12-19	1074	.521 (.444–.559)	.584 (.529–.633)	.738 (.678–.789)	.980 (.938–1.04)	1.33 (1.25–1.46)	2.09 (1.87–2.47)	3.39 (2.48–7.17)
12-19, fasted	555	.498 (.357–.538)	.557 (.499–.600)	.695 (.626–.749)	.921 (.839–.989)	1.21 (1.10–1.30)	1.53 (1.43–1.73)	1.86 (1.73–2.18)
12-19, nonfasted	519	.562 (.478–.601)	.623 (.566–.677)	.806 (.727–.873)	1.05 (.979–1.16)	1.63 (1.34–2.04)	3.35 (2.41–4.95)	7.18 (4.53–17.9)
20-39	1730	.438 (.364–.491)	.526 (.449–.585)	.695 (.636–.754)	.922 (.861–.974)	1.27 (1.18–1.34)	2.12 (1.79–2.62)	4.33 (3.52–5.88)
20-39, fasted	907	.383 (.335–.443)	.496 (.386–.549)	.657 (.580–.710)	.851 (.790–.923)	1.10 (1.01–1.25)	1.54 (1.42–1.96)	2.18 (1.79–3.69)
20-39, nonfasted	823	.476 (.418–.548)	.579 (.495–.632)	.764 (.698–.815)	.990 (.930–1.06)	1.43 (1.34–1.51)	3.22 (2.42–5.33)	7.33 (5.78–11.3)
40-59	1604	.481 (.428–.517)	.556 (.500–.612)	.710 (.666–.759)	.945 (.909–.978)	1.32 (1.25–1.44)	2.63 (2.16–3.34)	6.74 (4.40–11.7)
40-59, fasted	827	.470 (.409–.503)	.542 (.476–.580)	.660 (.611–.724)	.878 (.836–.932)	1.19 (1.09–1.25)	1.73 (1.52–2.24)	2.59 (1.95–5.05)
40-59, nonfasted	777	.500 (.428–.554)	.608 (.534–.671)	.778 (.737–.815)	1.03 (.958–1.10)	1.63 (1.37–1.96)	4.99 (3.26–7.42)	12.2 (7.07–28.5)
$\geq 60$	1524	.553 (.481–.625)	.674 (.604–.738)	.875 (.822–.914)	1.16 (1.11–1.22)	1.75 (1.57–2.12)	5.36 (3.46–7.24)	12.7 (10.2–17.0)
$\geq 60$ , fasted	751	.559 (.487–.611)	.648 (.595–.691)	.829 (.749–.888)	1.05 (.989–1.11)	1.40 (1.30–1.50)	2.08 (1.76–2.61)	2.81 (2.52–5.34)
$\geq 60$ , nonfasted	773	.531 (.400–.692)	.737 (.629–.788)	.928 (.871–1.00)	1.35 (1.23–1.57)	2.79 (2.12–3.68)	10.9 (7.03–16.9)	21.6 (13.7–45.8)
Sex								
Males	3745	.473 (.407–.511)	.553 (.510–.591)	.717 (.673–.765)	.959 (.913–1.01)	1.39 (1.32–1.48)	2.91 (2.59–3.81)	7.55 (6.51–10.5)
Males, fasted	1676	.435 (.355–.492)	.527 (.464–.562)	.665 (.614–.707)	.866 (.809–.928)	1.14 (1.07–1.23)	1.63 (1.46–1.87)	2.41 (1.89–3.93)
Males, nonfasted	2069	.501 (.426–.558)	.596 (.529–.660)	.793 (.747–.833)	1.08 (1.02–1.15)	1.84 (1.67–2.05)	6.41 (4.92–8.05)	12.6 (10.4–15.0)
Females	3717	.508 (.462–.545)	.607 (.550–.650)	.782 (.737–.826)	1.02 (.979–1.07)	1.46 (1.38–1.61)	2.95 (2.60–3.42)	7.90 (5.50–12.4)
Females, fasted	1670	.476 (.423–.522)	.562 (.480–.626)	.722 (.676–.777)	.954 (.907–.995)	1.28 (1.21–1.33)	1.76 (1.65–2.07)	2.58 (2.28–3.12)
Females, nonfasted	2047	.537 (.484–.590)	.661 (.597–.701)	.835 (.796–.882)	1.13 (1.06–1.20)	1.79 (1.65–2.03)	5.46 (4.25–7.60)	17.1 (10.9–26.6)



# Supplementary material

Race-ethnicity <sup>b</sup>								
Hispanic	1803	.418 (.349–.476)	.503 (.422–.568)	.673 (.591–.740)	.904 (.836–.970)	1.23 (1.15–1.33)	1.93 (1.76–2.19)	3.84 (2.72–6.59)
Hispanic, fasted	780	.382 (.336–.422)	.462 (.384–.516)	.620 (.521–.696)	.825 (.759–.911)	1.08 (1.01–1.18)	1.43 (1.33–1.57)	1.78 (1.56–2.08)
Hispanic, nonfasted	1023	.475 (.375–.528)	.559 (.496–.592)	.724 (.664–.784)	.975 (.915–1.05)	1.43 (1.34–1.54)	2.85 (2.22–4.26)	8.56 (4.30–13.5)
MA	993	.400 (.332–.475)	.499 (.390–.580)	.678 (.581–.769)	.915 (.838–.979)	1.21 (1.12–1.34)	1.77 (1.55–2.11)	2.79 (2.11–5.87)
MA, fasted	433	.366 (.273–.417)	.447 (.321–.538)	.626 (.487–.751)	.835 (.763–.925)	1.09 (.982–1.24)	1.37 (1.29–1.61)	1.70 (1.50–2.12)
MA, nonfasted	560	.469 (.299–.552)	.564 (.473–.599)	.742 (.630–.825)	.978 (.921–1.07)	1.37 (1.24–1.53)	2.34 (1.93–3.25)	6.45 (3.12–12.0)
NHW	2402	.531 (.458–.565)	.616 (.560–.661)	.787 (.742–.831)	1.03 (.985–1.07)	1.50 (1.43–1.64)	3.47 (3.22–4.42)	10.0 (7.60–12.0)
NHW, fasted	1126	.517 (.435–.550)	.569 (.519–.631)	.717 (.668–.769)	.936 (.885–.983)	1.24 (1.19–1.31)	1.78 (1.67–2.10)	2.78 (2.44–3.37)
NHW, nonfasted	1276	.558 (.472–.640)	.685 (.625–.736)	.860 (.823–.897)	1.18 (1.13–1.24)	2.04 (1.87–2.32)	7.26 (6.29–9.07)	16.4 (12.9–21.9)
NHB	2027	.495 (.460–.520)	.581 (.530–.622)	.757 (.720–.789)	1.02 (.968–1.06)	1.48 (1.39–1.62)	2.59 (2.35–2.92)	5.36 (4.25–6.69)
NHB, fasted	899	.455 (.410–.501)	.548 (.497–.604)	.723 (.665–.778)	.968 (.922–1.02)	1.30 (1.21–1.48)	1.82 (1.65–2.09)	2.49 (2.03–3.34)
NHB, nonfasted	1128	.525 (.502–.541)	.609 (.567–.641)	.778 (.746–.827)	1.08 (1.01–1.17)	1.69 (1.58–1.86)	3.61 (3.05–4.95)	8.58 (6.72–13.8)
NHA	947	.376 (.294–.407)	.437 (.399–.483)	.586 (.543–.635)	.799 (.744–.862)	1.12 (1.06–1.26)	2.25 (1.80–2.96)	5.13 (3.28–9.13)
NHA, fasted	439	.347 (.262–.390)	.416 (.359–.467)	.555 (.494–.622)	.720 (.670–.789)	.972 (.890–1.08)	1.25 (1.16–1.42)	1.78 (1.38–2.24)
NHA, unfasted	508	.400 (.325–.424)	.479 (.417–.508)	.625 (.557–.688)	.907 (.806–1.01)	1.43 (1.22–1.88)	3.80 (2.74–8.18)	11.1 (7.03–17.8)

NHANES, National Health and Nutrition Examination Survey; MA, Mexican American; NHW, non-Hispanic White; NHB, non-Hispanic Black; NHA, non-Hispanic Asian.

<sup>a</sup> Values are percentiles (95% CI) and were measured by microbiologic assay; “fasted” refers to no food intake for past  $\geq 8$  hours; “nonfasted” refers to food intake during the last 8 hours.

<sup>b</sup> Hispanic subgroup represents the sum of Mexican American and other Hispanic ethnicity (not shown).

† Estimate is subject to greater uncertainty due to small sample size ( $n < 224$ ).

**Supplementary Table S10.** Selected percentile concentrations of serum non-methyl folate by demographic variable categories for the US population  $\geq 1$  year, NHANES 2011–2<sup>a</sup>

Variable categories	Sample size <i>n</i>	5 <sup>th</sup>	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>	95 <sup>th</sup>
nmol/L								
All	7458	<LOD	<LOD	1.08 (<LOD–1.18)	1.42 (1.30–1.58)	2.05 (1.60–4.08)	4.24 (3.01–6.07)	5.16 (4.43–6.85)
All, fasted	3348	<LOD	<LOD	1.07 (<LOD–1.18)	1.42 (1.28–1.58)	1.97 (1.58–4.19)	4.23 (2.93–6.03)	4.99 (4.37–6.87)
All, nonfasted	4110	<LOD	<LOD	1.08 (<LOD–1.18)	1.42 (1.31–1.57)	2.09 (1.62–3.97)	4.25 (3.02–6.19)	5.29 (4.48–7.14)
Age, year								
1-5	570	<LOD	1.06 (<LOD–1.14)	1.32 (1.25–1.40)	1.67 (1.52–1.82)	2.59 (1.95–4.00)	4.39 (3.57–6.35)	5.58 (4.93–6.78)
1-5, fasted	77	<LOD†	1.08† (<LOD–1.26)	1.41 (1.04–1.50)	1.66 (1.42–1.82)	2.30 (1.78–5.31)	4.96† (3.68–12.6)	7.00† (4.81–12.6)
1-5, nonfasted	493	<LOD	1.06 (<LOD–1.15)	1.32 (1.22–1.40)	1.67 (1.53–1.85)	2.61 (1.97–3.79)	4.36 (3.40–6.33)	5.46 (4.73–6.79)
6-11	959	<LOD	<LOD	1.17 (1.03–1.30)	1.54 (1.37–1.83)	2.59 (1.75–4.44)	4.42 (3.54–5.70)	5.29 (4.71–6.49)
6-11, fasted	231	<LOD	<LOD	1.15 (<LOD–1.29)	1.48 (1.36–1.70)	2.18 (1.58–5.25)	3.98 (2.59–8.28)	5.42 (3.89–8.28)
6-11, nonfasted	728	<LOD	<LOD	1.18 (1.01–1.32)	1.55 (1.37–1.85)	2.73 (1.84–4.28)	4.49 (3.77–5.58)	5.29 (4.86–6.20)
12-19	1074	<LOD	<LOD	<LOD	1.31 (1.18–1.46)	1.76 (1.42–3.91)	3.70 (2.44–5.87)	4.38 (3.85–6.20)
12-19, fasted	555	<LOD	<LOD	<LOD	1.30 (1.20–1.48)	1.77 (1.36–4.29)	3.85 (2.74–5.52)	4.46 (3.89–5.86)
12-19, nonfasted	519	<LOD	<LOD	<LOD	1.31 (1.16–1.45)	1.75 (1.45–3.41)	3.50 (2.33–5.99)	4.28 (3.57–6.98)
20-39	1730	<LOD	<LOD	1.03 (<LOD–1.13)	1.35 (1.21–1.56)	2.03 (1.44–4.56)	4.29 (3.19–5.94)	4.95 (4.34–7.06)
20-39, fasted	907	<LOD	<LOD	1.03 (<LOD–1.16)	1.38 (1.21–1.55)	1.94 (1.46–4.47)	4.24 (3.12–5.97)	4.85 (4.32–7.56)
20-39, nonfasted	823	<LOD	<LOD	1.02 (<LOD–1.12)	1.34 (1.19–1.58)	2.16 (1.43–4.72)	4.31 (3.14–6.21)	5.12 (4.33–7.52)
40-59	1605	<LOD	<LOD	1.01 (<LOD–1.15)	1.36 (1.25–1.48)	1.81 (1.55–3.13)	3.98 (2.17–6.31)	5.05 (4.13–7.83)
40-59, fasted	828	<LOD	<LOD	1.06 (<LOD–1.17)	1.39 (1.24–1.56)	1.90 (1.55–3.98)	4.30 (2.38–6.38)	4.94 (4.41–7.17)
40-59, nonfasted	777	<LOD	<LOD	<LOD	1.35 (1.22–1.45)	1.73 (1.55–2.41)	3.68 (2.14–5.70)	5.22 (3.82–11.5)
$\geq 60$	1520	<LOD	<LOD	1.24 (1.10–1.33)	1.61 (1.47–1.79)	2.33 (1.83–4.27)	4.69 (3.06–7.35)	5.95 (4.92–8.27)
$\geq 60$ , fasted	750	<LOD	<LOD	1.22 (1.01–1.34)	1.59 (1.46–1.73)	2.15 (1.77–4.15)	4.38 (2.61–7.03)	5.27 (4.42–8.38)
$\geq 60$ , nonfasted	770	<LOD	<LOD	1.25 (1.12–1.35)	1.65 (1.46–1.87)	2.51 (1.88–4.76)	5.08 (3.23–8.22)	6.46 (5.13–9.66)
Sex								
Males	3746	<LOD	<LOD	1.06 (<LOD–1.16)	1.43 (1.30–1.57)	2.05 (1.59–3.97)	4.00 (2.93–5.99)	4.95 (4.20–6.60)
Males, fasted	1678	<LOD	<LOD	1.06 (<LOD–1.16)	1.42 (1.28–1.57)	1.89 (1.57–4.11)	4.12 (2.84–6.05)	4.85 (4.22–6.57)
Males, nonfasted	2068	<LOD	<LOD	1.06 (<LOD–1.17)	1.43 (1.30–1.58)	2.14 (1.61–3.90)	3.97 (2.99–6.09)	5.11 (4.14–7.45)
Females	3712	<LOD	<LOD	1.09 (<LOD–1.19)	1.42 (1.29–1.58)	2.03 (1.61–4.23)	4.43 (3.02–6.17)	5.43 (4.61–6.85)
Females, fasted	1670	<LOD	<LOD	1.08 (<LOD–1.21)	1.42 (1.28–1.59)	2.05 (1.58–4.36)	4.38 (2.87–6.31)	5.16 (4.42–8.24)
Females, nonfasted	2042	<LOD	<LOD	1.09 (<LOD–1.19)	1.42 (1.30–1.58)	2.03 (1.63–4.16)	4.56 (3.04–6.23)	5.55 (4.81–6.80)

# Supplementary material

Race-ethnicity <sup>b</sup>								
Hispanic	1803	.710	.710	1.04 (.710–1.26)	1.46 (1.15–2.17)	3.35 (1.57–5.33)	4.82 (4.07–6.42)	5.54 (4.91–7.35)
Hispanic, fasted	782	.710	.710	1.03 (.710–1.24)	1.42 (1.14–1.95)	3.20 (1.50–5.18)	4.70 (3.98–6.22)	5.28 (4.74–6.63)
Hispanic, nonfasted	1021	.710	.710	1.05 (.710–1.29)	1.49 (1.15–2.51)	3.52 (1.64–5.42)	5.03 (4.08–6.79)	5.61 (5.04–10.7)
MA	995	<LOD	<LOD	1.12 (<LOD–1.32)	1.49 (1.19–2.44)	3.29 (1.54–5.54)	4.71 (3.98–6.15)	5.36 (4.82–6.49)
MA, fasted	435	<LOD	<LOD	1.11 (<LOD–1.29)	1.46 (1.18–2.34)	3.45 (1.49–5.80)	4.69 (4.07–6.51)	5.22 (4.71–6.64)
MA, nonfasted	560	<LOD	<LOD	1.13 (<LOD–1.34)	1.52 (1.20–2.58)	3.16 (1.60–5.57)	4.86 (3.96–5.78)	5.37 (4.91–6.80)
NHW	2398	<LOD	<LOD	1.08 (<LOD–1.18)	1.40 (1.30–1.53)	1.85 (1.59–3.01)	3.62 (2.14–6.84)	4.83 (3.77–7.99)
NHW, fasted	1124	<LOD	<LOD	1.08 (<LOD–1.19)	1.41 (1.28–1.54)	1.81 (1.58–3.12)	3.70 (2.10–6.80)	4.71 (3.82–7.41)
NHW, nonfasted	1274	<LOD	<LOD	1.09 (<LOD–1.18)	1.39 (1.31–1.52)	1.88 (1.60–2.87)	3.50 (2.19–6.96)	5.06 (3.56–11.3)
NHB	2027	<LOD	<LOD	1.08 (<LOD–1.30)	1.62 (1.26–2.48)	3.42 (1.78–5.54)	4.95 (3.95–7.16)	5.61 (5.04–7.36)
NHB, fasted	899	<LOD	<LOD	1.04 (<LOD–1.27)	1.54 (1.24–2.15)	3.04 (1.69–5.51)	4.67 (3.68–8.28)	5.53 (4.71–8.35)
NHB, nonfasted	1128	<LOD	<LOD	1.12 (<LOD–1.35)	1.71 (1.26–2.87)	3.64 (1.94–5.47)	5.04 (4.20–7.01)	5.89 (5.19–7.60)
NHA	948	<LOD	<LOD	1.09 (<LOD–1.21)	1.42 (1.27–1.61)	2.05 (1.53–4.51)	4.29 (2.51–12.0)	5.23 (4.03–12.0)
NHA, fasted	441	<LOD	<LOD	1.11 (<LOD–1.25)	1.44 (1.26–1.77)	2.27 (1.50–5.73)	4.47 (2.49–12.0)	5.38 (4.06–12.0)
NHA, unfasted	507	<LOD	<LOD	1.07 (<LOD–1.19)	1.40 (1.27–1.52)	1.86 (1.53–3.58)	3.82 (2.53–7.13)	4.96 (3.83–9.45)

NHANES, National Health and Nutrition Examination Survey; MA, Mexican American; NHW, non-Hispanic White; NHB, non-Hispanic Black; NHA, non-Hispanic Asian.

<sup>a</sup> Values are percentiles (95% CI) and were measured by microbiologic assay; “fasted” refers to no food intake for past  $\geq 8$  hours; “nonfasted” refers to food intake during the last 8 hours.

<sup>b</sup> Hispanic subgroup represents the sum of Mexican American and other Hispanic ethnicity (not shown).

† Estimate is subject to greater uncertainty due to small sample size ( $n < 224$ ).

**Supplementary Table S11.** Selected percentile concentrations of serum MeFox by demographic variable categories for the US population  $\geq 1$  year, NHANES 2011–2<sup>a</sup>

Variable categories	Sample size <i>n</i>	5 <sup>th</sup>	10 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	90 <sup>th</sup>	95 <sup>th</sup>
nmol/L								
All	7469	.530 (.495–.558)	.642 (.608–.672)	.937 (.885–.985)	1.49 (1.40–1.59)	2.44 (2.28–2.59)	3.76 (3.55–3.99)	4.81 (4.52–5.12)
All, fasted	3350	.466 (.432–.500)	.568 (.527–.601)	.750 (.709–.795)	1.13 (1.04–1.19)	1.71 (1.60–1.86)	2.58 (2.38–2.92)	3.61 (3.19–4.24)
All, nonfasted	4119	.644 (.602–.694)	.839 (.804–.869)	1.26 (1.18–1.34)	1.95 (1.83–2.10)	2.94 (2.80–3.14)	4.37 (4.14–4.56)	5.54 (5.16–5.98)
Age, year								
1-5	575	.410 (<LOD–.494)	.513 (.433–.573)	.708 (.635–.774)	1.31 (1.09–1.52)	2.26 (1.83–3.01)	3.81 (3.10–5.13)	4.51 (3.88–6.15)
1-5, fasted	77	<LOD†	<LOD†	.442 (<LOD–.591)	.622 (.467–.766)	.805 (.703–1.80)	1.25† (.844–5.70)	2.07† (1.01–5.70)
1-5, nonfasted	498	.473 (<LOD–.530)	.561 (.515–.594)	.781 (.697–.913)	1.44 (1.27–1.67)	2.48 (1.86–3.40)	3.85 (3.40–5.14)	4.56 (3.92–7.25)
6-11	960	.434 (.383–.457)	.511 (.468–.554)	.784 (.685–.887)	1.52 (1.33–1.64)	2.39 (2.19–2.70)	3.60 (3.05–4.07)	4.17 (3.89–4.75)
6-11, fasted	231	<LOD	.375 (<LOD–.410)	.457 (.442–.485)	.597 (.546–.630)	.745 (.697–.847)	.930 (.867–1.75)	1.47 (.942–4.30)
6-11, nonfasted	729	.584 (.503–.656)	.755 (.645–.854)	1.17 (1.08–1.26)	1.83 (1.65–1.96)	2.68 (2.38–3.04)	3.83 (3.28–4.36)	4.37 (3.94–5.60)
12-19	1074	.493 (.443–.532)	.591 (.516–.663)	.824 (.730–.927)	1.27 (1.09–1.46)	2.17 (1.83–2.50)	3.17 (2.93–3.62)	3.94 (3.57–4.32)
12-19, fasted	555	.440 (<LOD–.479)	.517 (.470–.559)	.681 (.626–.711)	.916 (.828–1.01)	1.35 (1.15–1.54)	1.88 (1.61–2.48)	2.48 (2.01–3.31)
12-19, nonfasted	519	.666 (.505–.877)	.925 (.661–1.01)	1.23 (1.06–1.39)	1.94 (1.59–2.26)	2.92 (2.60–3.26)	3.93 (3.55–4.20)	4.44 (4.16–5.23)
20-39	1730	.530 (.482–.558)	.632 (.588–.669)	.871 (.812–.932)	1.39 (1.28–1.50)	2.21 (1.98–2.48)	3.22 (3.07–3.53)	4.33 (3.94–4.74)
20-39, fasted	907	.460 (.389–.522)	.562 (.502–.617)	.721 (.690–.774)	1.07 (1.01–1.15)	1.62 (1.48–1.77)	2.39 (2.14–2.78)	3.12 (2.80–3.67)
20-39, nonfasted	823	.636 (.560–.706)	.760 (.719–.851)	1.20 (1.08–1.33)	1.82 (1.65–2.02)	2.74 (2.55–2.90)	3.95 (3.58–4.32)	4.87 (4.39–5.94)
40-59	1606	.547 (.518–.588)	.657 (.615–.699)	.945 (.873–1.00)	1.46 (1.35–1.56)	2.34 (2.14–2.54)	3.77 (3.44–4.14)	4.51 (4.26–5.18)
40-59, fasted	829	.514 (.442–.546)	.597 (.539–.639)	.772 (.723–.826)	1.15 (1.03–1.21)	1.71 (1.52–1.93)	2.58 (2.32–3.19)	3.61 (2.85–4.48)
40-59, nonfasted	777	.727 (.588–.794)	.879 (.825–.975)	1.26 (1.18–1.37)	1.95 (1.82–2.10)	2.97 (2.67–3.42)	4.42 (4.02–5.12)	5.69 (4.86–6.86)
$\geq 60$	1524	.701 (.599–.777)	.858 (.771–.943)	1.24 (1.14–1.36)	1.90 (1.78–2.04)	2.94 (2.83–3.16)	4.98 (4.54–5.31)	6.63 (5.77–7.41)
$\geq 60$ , fasted	751	.591 (.470–.670)	.732 (.606–.829)	1.04 (.920–1.17)	1.50 (1.38–1.61)	2.17 (1.96–2.36)	3.70 (3.25–4.43)	5.26 (4.40–6.83)
$\geq 60$ , nonfasted	773	.892 (.787–.999)	1.13 (1.04–1.22)	1.69 (1.45–1.86)	2.50 (2.32–2.67)	3.70 (3.36–4.01)	5.54 (5.13–6.72)	7.60 (6.90–9.17)
Sex								
Males	3750	.529 (.487–.565)	.647 (.594–.679)	.913 (.851–.975)	1.47 (1.37–1.56)	2.40 (2.23–2.57)	3.68 (3.34–3.98)	4.50 (4.16–5.13)
Males, fasted	1679	.461 (.398–.510)	.558 (.520–.591)	.729 (.691–.780)	1.07 (.985–1.18)	1.61 (1.48–1.76)	2.51 (2.30–2.91)	3.42 (2.95–4.08)
Males, nonfasted	2071	.677 (.620–.736)	.848 (.788–.907)	1.29 (1.18–1.41)	1.95 (1.79–2.16)	2.92 (2.69–3.24)	4.15 (3.95–4.45)	5.33 (4.71–6.58)
Females	3719	.532 (.486–.562)	.639 (.614–.675)	.955 (.914–1.01)	1.52 (1.41–1.64)	2.46 (2.29–2.64)	3.87 (3.64–4.27)	5.02 (4.63–5.63)
Females, fasted	1671	.473 (.444–.504)	.588 (.526–.617)	.767 (.717–.822)	1.17 (1.10–1.22)	1.82 (1.67–1.96)	2.64 (2.39–3.18)	3.70 (3.43–4.36)
Females, nonfasted	2048	.611 (.564–.668)	.831 (.781–.871)	1.22 (1.15–1.30)	1.96 (1.85–2.10)	2.97 (2.83–3.15)	4.51 (4.36–4.79)	5.69 (5.28–6.37)

# Supplementary material

Race-ethnicity <sup>b</sup>								
Hispanic	1806	.453 (.415–.474)	.547 (.521–.569)	.752 (.719–.803)	1.22 (1.15–1.31)	2.05 (1.94–2.19)	3.17 (2.96–3.34)	4.00 (3.75–4.47)
Hispanic, fasted	782	.381 (<LOD–.428)	.465 (.433–.500)	.636 (.602–.667)	.842 (.806–.895)	1.27 (1.18–1.40)	2.01 (1.90–2.33)	2.82 (2.53–3.22)
Hispanic, nonfasted	1024	.557 (.500–.629)	.718 (.643–.799)	1.13 (1.06–1.20)	1.70 (1.59–1.77)	2.62 (2.43–2.78)	3.80 (3.50–4.14)	4.57 (4.38–4.90)
MA	996	.435 (.372–.483)	.534 (.492–.566)	.719 (.672–.782)	1.19 (1.09–1.25)	1.94 (1.76–2.16)	3.11 (2.83–3.45)	3.99 (3.51–4.72)
MA, fasted	435	<LOD (<LOD–.414)	.449 (.393–.499)	.627 (.582–.660)	.817 (.789–.848)	1.24 (1.10–1.38)	1.98 (1.78–2.30)	2.86 (2.33–3.42)
MA, nonfasted	561	.534 (.460–.613)	.650 (.569–.728)	1.08 (.997–1.18)	1.61 (1.46–1.78)	2.42 (2.22–2.81)	3.76 (3.28–4.37)	4.59 (4.23–5.25)
NHW	2402	.597 (.563–.625)	.711 (.677–.753)	1.03 (.991–1.09)	1.62 (1.51–1.75)	2.56 (2.41–2.76)	3.99 (3.77–4.23)	5.12 (4.71–5.68)
NHW, fasted	1126	.539 (.487–.582)	.631 (.591–.670)	.841 (.800–.900)	1.25 (1.17–1.32)	1.82 (1.69–1.97)	2.76 (2.49–3.19)	3.99 (3.41–4.64)
NHW, nonfasted	1276	.752 (.687–.783)	.935 (.876–1.01)	1.38 (1.28–1.48)	2.12 (1.99–2.31)	3.14 (2.94–3.34)	4.52 (4.37–4.87)	5.98 (5.55–6.65)
NHB	2027	.437 (.410–.476)	.528 (.507–.553)	.731 (.706–.767)	1.18 (1.13–1.22)	1.87 (1.77–1.98)	2.88 (2.70–3.09)	3.91 (3.64–4.25)
NHB, fasted	899	.400 (.361–.425)	.476 (.429–.513)	.625 (.596–.661)	.902 (.839–.957)	1.42 (1.28–1.60)	2.25 (2.04–2.62)	3.21 (2.53–4.15)
NHB, nonfasted	1128	.520 (.453–.567)	.622 (.596–.657)	.946 (.901–1.00)	1.46 (1.41–1.50)	2.15 (2.05–2.29)	3.21 (2.99–3.62)	4.33 (4.04–4.81)
NHA	951	.507 (.461–.543)	.612 (.545–.664)	.910 (.814–1.01)	1.54 (1.36–1.78)	2.70 (2.45–3.04)	4.24 (3.81–4.75)	5.54 (5.11–6.13)
NHA, fasted	441	.440 (<LOD–.497)	.520 (.472–.558)	.677 (.623–.744)	.996 (.911–1.08)	1.44 (1.30–1.71)	2.18 (1.95–2.48)	2.77 (2.42–3.86)
NHA, unfasted	510	.712 (.647–.787)	.970 (.864–1.08)	1.56 (1.38–1.72)	2.43 (2.22–2.62)	3.67 (3.51–3.79)	5.20 (4.98–5.69)	6.86 (6.05–8.14)

NHANES, National Health and Nutrition Examination Survey; MA, Mexican American; NHW, non-Hispanic White; NHB, non-Hispanic Black; NHA, non-Hispanic Asian.

<sup>a</sup> Values are percentiles (95% CI) and were measured by microbiologic assay; “fasted” refers to no food intake for past  $\geq 8$  hours; “nonfasted” refers to food intake during the last 8 hours.

<sup>b</sup> Hispanic subgroup represents the sum of Mexican American and other Hispanic ethnicity (not shown).

† Estimate is subject to greater uncertainty due to small sample size ( $n < 224$ ).